

Remarks

Reconsideration of this Application is respectfully requested.

Two duplicate Office Actions were mailed by the United States Patent and Trademark Office (USPTO) on March 13, 2002 and March 27, 2002. In a telephone interview with Examiner R. Chang and Applicants' representative, Michael Messinger, Reg. No. 37, 575, the Examiner indicated the second later Office Action was a duplicate. The Examiner further indicated that the period for reply was extended by the mailing of the second Office Action, and therefore a shortened statutory period for reply is set from the March 27, 2002 mailing date of the second Office Action.

Upon entry of the foregoing amendment, claims 21 to 43 are pending in the application, with claims 21, 28, 42, and 43 being the independent claims. Claims 11 to 20 are sought to be cancelled without prejudice to or disclaimer of the subject matter therein. New claims 28 to 43 are sought to be added. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

A new Abstract is submitted which includes a concise statement regarding methods for planarizing a substrate in a probe card assembly. Applicants respectfully request that the objection to the Abstract be withdrawn.

The drawings were objected to for not showing the "translating" feature recited in claims 26 and 27. Applicants respectfully traverse. Examples of translating a substrate in x, y, and z directions are described in the specification at pages 13 to 15 with specific references to Figs. 6 and 7A, 7B. Accordingly, Applicants respectfully request that this objection be withdrawn.

The Examiner objected to claims 21 to 27 for reciting "A method " instead of "The method." Applicants note this is a cosmetic change not a narrowing amendment and is only applicable to dependent claims 22 to 27. Accordingly, Applicants have amended dependent claims 22 to 27 to make this cosmetic change and respectfully request that this objection be withdrawn.

Applicants respectfully traverse the objection by the Examiner regarding duplicate claims; however, this objection is now moot since claim 13 and 14 have been canceled.

Claim 21 has been amended to define the invention even more clearly and broadly. Accordingly, Applicants respectfully request that the rejection of claim 21 and dependent claims 22 to 27 under 35 U.S.C. § 112, second paragraph be withdrawn.

Claims 14, 16, 20-22 and 24-27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,189,876 issued to Frazier *et al.* ("Frazier"). Claims 13, 17, 19 and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 6,189,876 issued to Frazier *et al.* ("Frazier"). Applicants respectfully traverse each rejection.

Claims 13, 14, 16, 17, 19, and 20 have been canceled without prejudice or disclaimer.

Further, Frazier does not teach or suggest each and every element of claims 21-27, as amended. Frazier describes a platform for leveling an upper surface of a printed circuit board (PCB) placed on a plate 14 on a work table 12 (see, abstract and FIG. 1). The PCB may have an uneven surface due to components 48, as shown in FIG. 2. A plate 14 is attached to a base 20 by legs 16 (col. 4, lns. 16-20). Legs 16 can tilt plate 14 so that the surface of the PCB in plate 14 is even or flat (FIG. 3, col. 4, lns. 23-34 and col. 6, lns. 1-54). A suction system 52 is also used to make the surface of the PCB flat (see, col. 6, ln. 65-col. 8, ln.2).

Frazier simply does not teach or suggest adjusting a surface defined by contact portions of contact elements of a substrate. Absent the use of impermissible hindsight, the Examiner further does not even point to any specific teaching in Frazier or elsewhere that would suggest combining Frazier to adjust a surface defined by contact portions much less arrive at the claim invention. Frazier further does not teach or suggest mounting a substrate relative to a board member, and then planarizing the contact portions of contact elements on the substrate.

The Examiner takes Official Notice that "it is well known in the art to test a printed wiring substrate and the plurality of contact elements is couplable to an automated test system." (Office Action, pg. 4, section 10). Applicants respectfully traverse. No teaching or evidence is provided. Also, even if this Official Notice teaching is assumed to be well-known and combined with Frazier, this combination does not reach the claimed invention. For example, in one probe card assembly environment of the claimed invention, a substrate having a surface defined by contact elements is mounted with respect to a board member and adjusted relative to a surface of a device under test.

Other Matters

An Information Disclosure Statement, along with one sheet of Form PTO-1449, was filed on April 4, 2002. Prompt consideration of each item of information listed in the Information Disclosure Statement is requested.

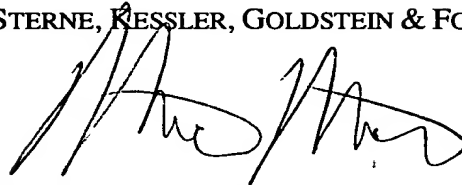
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C.

A handwritten signature in black ink, appearing to read 'Michael V. Messinger', is written over the firm name.

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Version with markings to show changes made

In the Specification:

Please substitute the paragraph beginning on page 4, line 8, with the following paragraph:

The present invention provides, in another embodiment, a method of achieving a degree of planarity among contact portions of a plurality of contact structures mounted to a substrate, in which the method includes creating the substrate with the plurality of contact structures connected to a first surface of the substrate, the contact portions of the contact structures having a first planar relationship relative to one another, and applying a plurality of forces selectively to the substrate to deform the substrate and achieve a second planar relationship of the contact portions of the contact structures relative to one another.

Please substitute the paragraph beginning on page 8, line 15, with the following paragraph:

More detailed discussions of printed wiring boards (e.g., probe cards), interposers, space transformers, drive plates, resilient contact structures, contact elements and other components of a probe card assembly that can be used in conjunction with the present invention can be found in U.S. Patent No. 5,974,662, U.S. Patent Application No. 08/920,255, titled "Making Discrete Power Connections to a Space Transformer of a Probe Card Assembly," now U.S. Patent No. 6,050,829, and U.S. Patent Application No. 09/042,606, titled "Probe Card Assembly and Kit," now U.S. Patent No. _____, all of which are incorporated by reference herein.

In the Claims:

21. (Amended) A method of adjusting [the] surfaces of a plurality of substrates, [each of] the surfaces defined by contact portions of a plurality of contact elements [disposed against a substrate of] coupled to the plurality of substrates, the method comprising:
applying a force to at least one substrate in the plurality of substrates to deform the at least one substrate [and change the shape of the surface of the substrate such that a first set of surface shapes is changed to a second set of surface shapes]; and
adjusting at least one substrate in the plurality of substrates such that the surfaces of the plurality of substrates [relative to one another to] define a collective surface shape.
22. (Amended) The [A] method as in claim 21 wherein said collective surface shape is formed relative to the shape of a reference surface.

23. (Amended) The [A] method as in claim 22 wherein said reference surface is located on a device to be tested.

24. (Amended) The [A] method as in claim 21 further comprising:
rotating at least one substrate of the plurality of substrates about an axis passing substantially through a plane defined by the contact portions of the plurality of contact elements.

25. (Amended) The [A] method as in claim 21 further comprising:
rotating at least one substrate of the plurality of substrates about an axis, substantially perpendicular to a plane by the contact portions of the plurality of contact elements.

26. (Amended) The [A] method as in claim 21 further comprising:
translating at least one substrate of the plurality of substrates substantially along a plane defined by the contact portions of the plurality of contact elements.

27. (Amended) The [A] method as in claim 21 further comprising:
translating at least one substrate of the plurality of substrates substantially perpendicularly to a plane defined by the contact portions of the plurality of contact elements.